

AEROMEDICAL CONCERNS: Coronary artery disease (CAD) is the leading cause of permanent suspension from flying duties. The major concern is sudden in-flight incapacitation as a result of sudden death, altered consciousness, or incapacitating angina. Heat, hypoxia, hyperventilation, work-related stress, and/or high Gz maneuvers all increase myocardial oxygen demand; thus, possibly provoking angina, dysrhythmia and infarction in individuals with pre-existing hemodynamically significant lesions.

WAIVERS: Hemodynamically significant lesions are disqualifying for all flying duty classes, and waiver will not be recommended. A waiver may be considered for those diagnosed with asymptomatic coronary artery disease, i.e. hemodynamically insignificant lesions, after appropriate evaluation.

Initial Class 1A/1W Applicants:

No exceptions to policy.

Initial Classes 2F, 3 and 4:

Waivers will be considered on a case-by-case basis for minimal coronary artery disease.

Rated and Nonrated Aviation Personnel (All Classes):

Hemodynamically significant coronary lesions are routinely screened for in our population using the Cardiovascular Screening Program (CVSP), which includes:

- LEVEL 1- Framingham Index, lipid profile
- LEVEL 2 -Aeromedical exercise stress test (AGXT) or Electron Beam CT
- LEVEL 3- Noninvasive Cardiac Imaging (i.e. Thallium GXT and/or Stress echocardiogram)
- LEVEL 4- coronary angiography if perfusion deficits are noted.

Minimal Coronary Artery Disease (MCAD) is defined as no hemodynamic abnormalities. These lesions do not cause reperfusion deficit on exercise thallium and have no abnormal wall motion on exercise echocardiogram. Waiver will be considered for MCAD.

Percutaneous Coronary Intervention with or without coronary stent placement may be waived providing the patient remains asymptomatic. Follow-up exercise thallium and exercise echocardiogram at six months must demonstrate hemodynamically normal function.

Significant Coronary Artery Disease (SCAD) is defined as hemodynamically significant findings such as found with abnormal perfusion on exercise thallium or abnormal wall movement or poor ejection fraction on exercise echocardiogram +/- confirmation by coronary angiography. SCAD is not waivable.

Regardless of luminal occlusion, if the lesion is associated with objective findings such as ventricular tachycardia or SVT, it is not waiverable. Any history consistent with mild myocardial infarct is not waiverable. Myocardial damage as detected by catheterization or exercise thallium is not waiverable. Coronary Artery Bypass Grafting is not waiverable.

INFORMATION REQUIRED:

- ☐ Complete cardiology consultation is required to include risk factor analysis
- ☐ Aeromedical Graded Exercise Test (AGXT) or EBCT
- ☐ Baseline Thallium or Sestamibi GXT scan
- ☐ Stress Echocardiogram with Doppler flow study
- ☐ Cardiac Catheterization, if above testing is inconclusive

Following consultation with USAAMA testing may be done locally, by the designated Army Aeromedical Consultant, or with Brooks Aeromedical Consultation Service (USAF ACS). An Aeromedical Summary to include final reports of all studies will be forwarded to USAAMA for review prior to any waiver action. If films or complete tracings are required they will be requested. Local flight clearance is not authorized unless granted in coordination with USAAMA.

FOLLOW-UP: Comprehensive cardiology evaluations should be performed every three years and include an interval history and physical examination for those who have an abnormal LEVEL 1 screen with a normal AGXT. Any person granted a waiver for Minimal Coronary Artery Disease (secondary to an abnormal AGXT) should have an annual stress thallium or stress echocardiogram. Repeat cardiac catheterization is not required unless there is a change in the patient's condition (decreased exercise tolerance or angina, for instance) or results from any of the previously mentioned follow up examination deviate from previous test results. In these cases, the aviator would be disqualified from aviation duties except for simulator flights until an evaluation and work-up by an aviation medicine qualified cardiology specialist is accomplished. The results would then be reviewed by AAMA and a recommendation for flying duty made.

TREATMENT: Only prophylactic aspirin, clopidogrel, nicotine weaning, antihypertensive therapy, and lipid lowering medications are approved. All other medications are not waiverable.

DISCUSSION: There is poor correlation between the severity of stenoses and their propensity to cause myocardial infarction, unstable angina, or sudden coronary death. Pathological studies have revealed that myocardial infarctions and unstable angina are most often caused by rupture of atherosclerotic plaques with formation of superimposed occlusive thrombus. The majority of atherosclerotic lesions responsible for serious events are mild stenoses of inconsequential hemodynamic significance and are characterized by abundance of lipid, numerous inflammatory cells, and a thin fragile fibrous cap. These observations suggest that although measurements of coronary flow reserve may be useful in the assessment of stenoses and in the identification of lesions responsible for effort angina, they are not likely to identify the more dangerous plaques

responsible for unstable angina, acute myocardial infarction and ischemic sudden death. Coronary artery bypass surgery will increase exercise tolerance and relieve angina in up to 85% of cases, but the symptoms recur in approximately 8% of the patients per year. Data on PTCA shows that with stent placement and aggressive risk factor reductions significantly reduces symptoms and infarction risks in near or long term studies.

REFERENCE:

Braunwald et al. 2001. *Stenosis Severity And Clinical Events*. In: Braunwald: Heart Disease: A Textbook of Cardiovascular Medicine, 6th ed., pp 1104. New York. W. B. Saunders Company